IN THE UNITED STATES PATENT AND TRADEMARK OFFICE	
DECLARATION UNDER 37 CFR 1.132	Atty. Docket No. **LIGHT1110-3**
Applicant(s) **William B. Dress et al.**	
Application Number **10/702,227**	Date Filed **Nov. 5, 2003**
For **OPTICAL FAN-OUT AND BROADCAST INTERCONNECT**	
Group Art Unit **2633**	Examiner **Pascal, Leslie C.**
Confirmation Number: **7989**	

Mail Stop Amendment
Commissioner for Patents
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Dear Sir:

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John J. Bruckner

I, William B. Dress, declare as follows:

1. I am the first named inventor of the above-identified pending U.S. utility patent application.

2. What is meant by the phrase "with regard to image forming geometry substantially corresponds to the node array" in the context of the other limitations of pending claim 9 is that (1) there is an array of communication signal emitters exemplified by lasers or LEDs emitting light directed through an optics array (e.g., array of lenses) towards a reflective structure (e.g., mirror) and (2) each node (e.g., module) of the node array (device) has formed thereon an optical image of the entire array of emitters that is reduced in size and lies at approximately the

center of each module. (It is important to appreciate that the received light patterns are similar in each module so that the modules may be interchanged without altering the receiver positions within a module.) This means a) that the array of emitters is defined not just by an individual node but by the array of nodes and b) that ON EACH MODULE at the location where a particular emitter is imaged, an optical receiver (e.g., photodetector) is located to receive light (e.g., to decode modulated message(s) riding on the beam of light).

Exhibit A shows figure 29. Exhibit B shows those portions that are viewable in figure 29 of I) the plurality of nodes, i) their optical emitters and ii) their optical receivers and II) the plurality of optics, i) their diverging elements and ii) their light collecting and focusing elements. Exhibit C shows the viewable members of the plurality of nodes of the embodiment depicted in figure 29, and the viewable optical signal emitters thereof. It can be appreciated 1) that portions of five of the nine nodes of the embodiment depicted in figure 29 can be seen in Exhibit C, and 2) that each of the nodes has four optical signal emitters (although only 2-3 of the optical signal emitters of each node can be seen in figure 29). Exhibit D shows the viewable members of the plurality of optical signal receivers located on each of the viewable members of the plurality of nodes. It can be appreciated 1) that again five of the nine nodes of this embodiment can be seen in Exhibit D, and 2) that each of the nodes has 36 optical receivers positioned to define an individual receiver array that with regard to image forming geometry substantially corresponds to the emitters of the node array. Exhibit E shows the nine plurality of optics of the embodiment depicted in figure 29 positioned to define an optics array. It can be appreciated that each of the plurality of optics in this embodiment includes 4 diverging elements and one light collecting and focusing element. Therefore, the (3x3) 9 members of the plurality of optics array with regard to image forming geometry substantially correspond to the nine nodes of the node array and the (4x9) 36 diverging elements of the optics array with regard to image forming geometry substantially correspond to the (36) optical receivers of each node of the node array and each of the individual receiver arrays. Therefore, the language recited in the claim(s) as amended of the above-identified pending U.S. utility patent application is definite to one of skill in the art of optics

when the claim(s) is(are) read in light of the description and drawings.

3. Christensen teaches broadcast by employing *multiple* emitters at each node each sending the same or different information in parallel to any or all other nodes in the system, with a view of sending a message broken into parts where the parts are sent in parallel over multiple channels simultaneously, thereby increasing the node-to-node bandwidth. However, Christensen simply does not disclose or suggest fanning out from a single emitter. Therefore, the Christensen et al (6326600) reference does not disclose or suggest the claimed invention as amended in the above-identified pending US patent application.

4. Krishnamoorthy teaches optical fan-out for an optical pattern processor. However, Krishnamoorthy simply does not disclose or suggest multiple independent optical receivers for each pattern transmitted. Therefore, the Krishnamoorthy et al (5541914) reference does not disclose or suggest the claimed invention as amended in the above-identified pending US patent application.

5. Even if one of ordinary skill were to combine the teachings of Christensen and Krishnamoorthy, the amalgamated teaching would not meeting the presently claimed combination of limitations. Claim 9 as amended requires a plurality of nodes positioned to define a node array, each of the plurality of nodes having an optical signal emitter and a plurality of optical signal receivers, the plurality of optical signal receivers positioned to define an individual receiver array that with regard to image forming geometry substantially corresponds to the node array; and a plurality of optics optically coupled to the array of nodes, the plurality of optics positioned to define an optics array whose members with regard to image forming geometry substantially correspond to the nodes of the node array, each of the plurality of optics including a diverging element and a light collecting and focusing element, wherein the diverging elements of the optics array with regard to image forming geometry substantially correspond to the optical receivers of

each node of the node array, wherein an optical signal from the optical signal emitter is fanned-out by the diverging element of one of the optics and broadcast to one of the plurality of receivers of all of the plurality of nodes by the light collecting and focusing element of all of the plurality of optics. Therefore, the claimed invention as amended in the above-identified pending US patent application is not disclosed or suggested by Christensen et al (6326600) and/or Krishnamoorthy et al (5541914) alone or in combination.

6. The currently claimed invention is simple to construct, inexpensive to manufacture, and scalable to a larger number of nodes. The nature of this invention, by construction, avoids point-to-point communications in favor of broadcast/multicast. For instance, the claimed invention can be based on each laser driving a multicast channel (allowing practically simple broadcast to take place) whereas each of the prior art lasers drove a single point-to-point channel. This difference is conceptual, functional, and practical as well as being non-obvious nor contained in prior disclosures.

None of the embodiments of the Christensen and Krishnamoorthy references is arranged in a modular fashion that allows field servicing, "hot swapping" of modules, among other desirable features. Likewise, none of the embodiments of the references for achieving a device fully interconnecting *n* computing or communication nodes has either implied or disclosed the advantage of modularity that dramatically reduces the number of optical components from *nxn* emitters and *nxn* receivers (prior art, particularly Christensen *et al.*) to *n* emitters and one nineth of *nxn* receivers (present invention as depicted in Fig. 29 and Exhibit A), with the concomitant reduction in electronics, circuits, and power consumption.

The Assignee of this application is the only presently known enterprise engaged in commercialization of a free-space, optical broadcast interconnect. Applicants' product has generated intense interest in certain government circles. These circles are keenly aware of developments and innovations in the area of multi-processor computing and, at the same time, desirous to acquire the Assignee's products. The Assignee of this application presently has firm

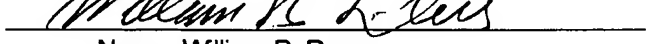
orders for such products from US government contractors who have no other solution at present.

Therefore, embodiments in accordance with the presently claimed invention can provide unexpected results including superior qualities and properties compared to what is disclosed and suggested by the closest cited and applied prior art reference(s), namely Christensen et al (6326600) and/or Krishnamoorthy et al (5541914)

7. In conclusion, a) the language of claims as amended is(are) definite to one of skill in the art of optics and b) the claimed invention as amended in the above-identified pending US patent application is not disclosed or suggested by Christensen et al (6326600) and/or Krishnamoorthy et al (5541914).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

20-June-2008
Dated:



Name: William B. Dress
Title: Senior Fellow, Lightfleet Corporation
(First named inventor)

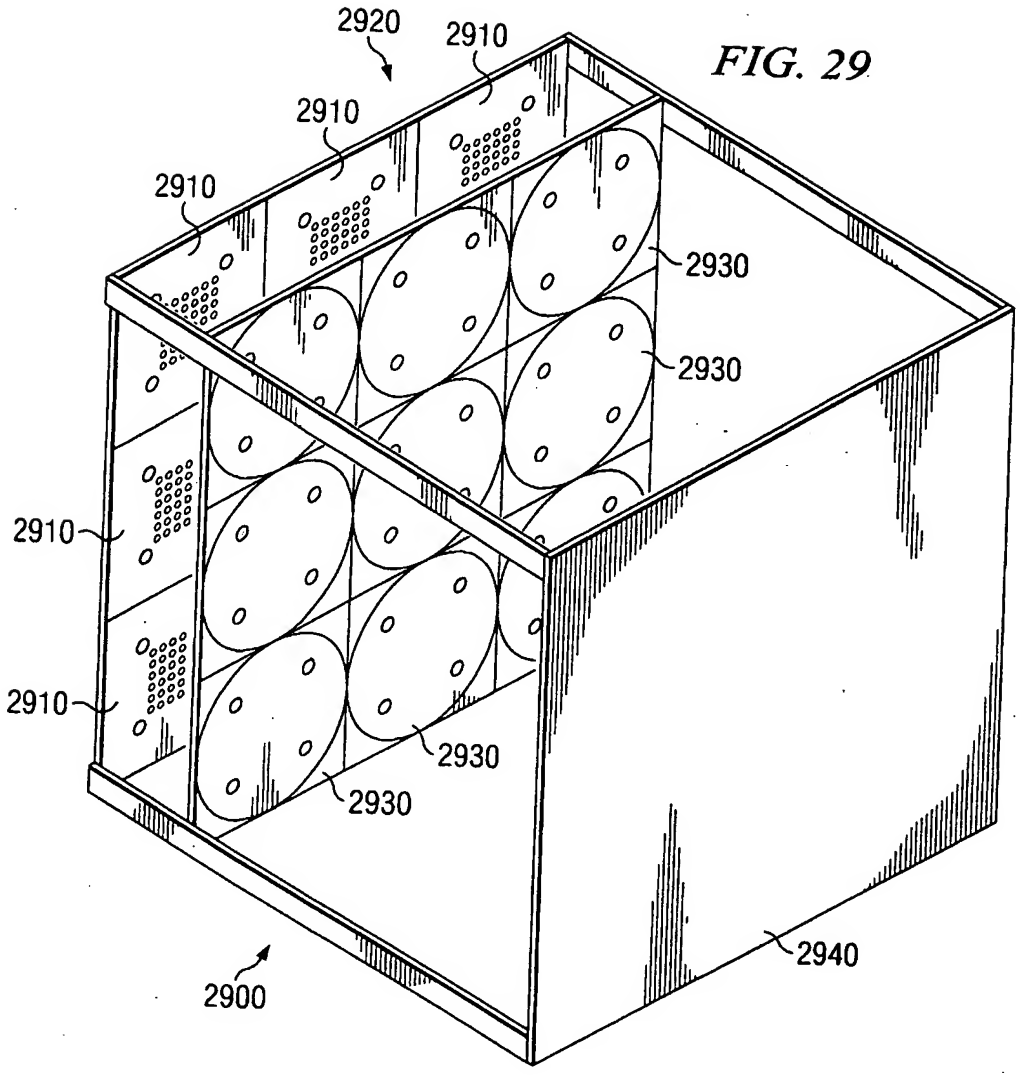


FIG. 29

Exhibit A

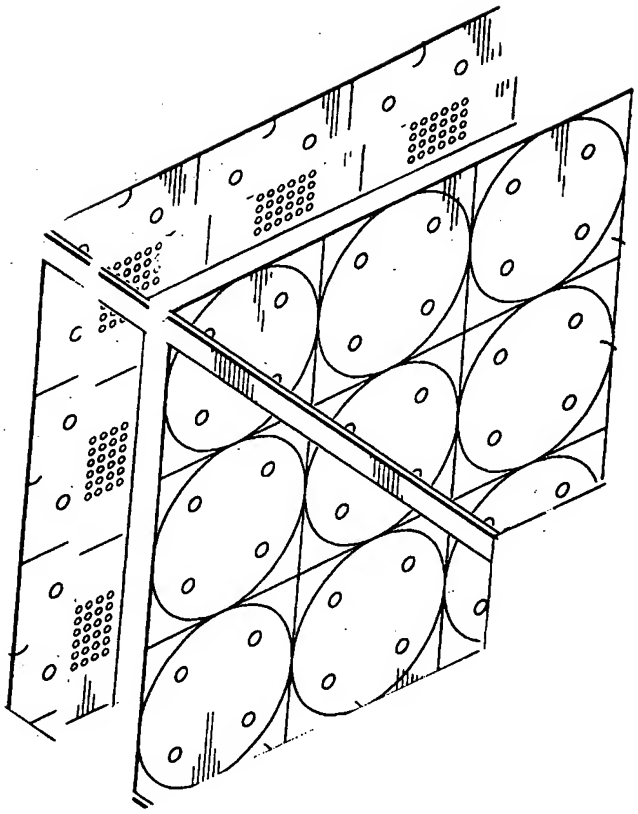
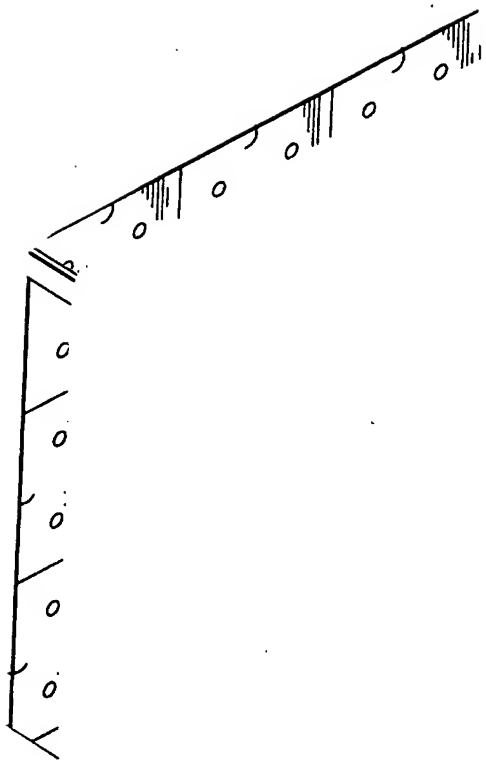


Exhibit B



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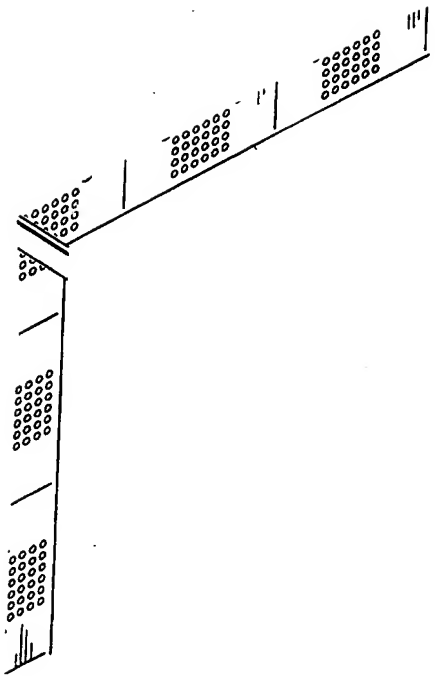

Exhibit D

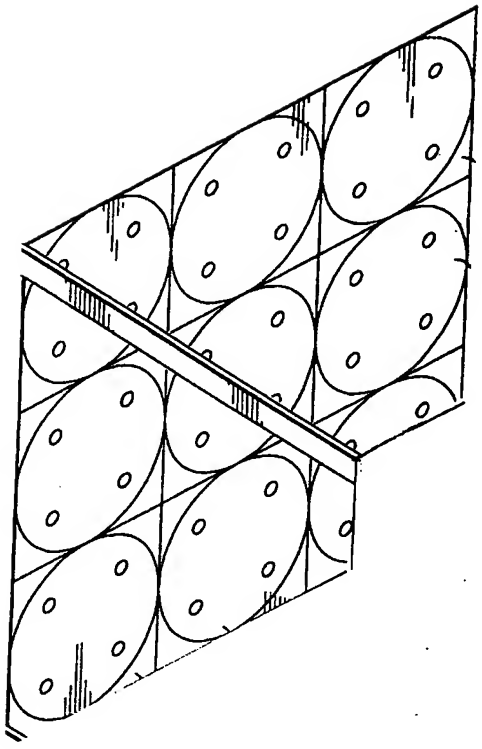

Exhibit E